

Question 3

First index

```
CREATE INDEX ProductPrice ON product(price);
```

This index allows our application to search the products with a price below a given price much faster. For example, if someone asks to find all products that have price less or equal to 500.00\$ for some reason, the database can use this index to find out the rightmost leaf page on the B+ tree and output all the corresponding data. In general, if there is no such index, the database needs to go through all of the data pages, but by having this index, the database will only need to go through in average half of the total data pages instead.

Second index

```
CREATE INDEX ReleaseDate ON release(release_date);
```

This index allows our application to search all products that have their release date before a given data much faster. For example, if someone wants to find all products that have release before 2018-01-01, the database can use this index to find out the rightmost leaf page on the B+ tree and output all the corresponding data. In general, if there is no such index, the database needs to go through all data pages, but by having this index, the database will need to go through in average half of the total data pages instead.